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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,747	12/14/2004	Jochen Dieter Mannhart	ABACP0110US	3101
43076 7590 01/11/2008 MARK D. SARALINO (GENERAL) RENNER, OTTO, BOISSELLE & SKLAR, LLP 1621 EUCLID AVENUE, NINETEENTH FLOOR CLEVELAND, OH 44115-2191			EXAMINER VIJAYAKUMAR, KALLAMBELLA M	
			ART UNIT 1793	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/501,747

Applicant(s)

MANNHART, JOCHEN DIETER

Examiner

Kallambella Vijayakumar

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/29/2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 41,42,44-48 and 50-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 41,42,44-48 and 50-59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

- Claim-41, 42, 44-46 were amended. Claims 1-40, 43, 49 cancelled. New claims 51-59 added. Claims 41-42, 44-48 and 50-59 as amended are currently pending with the application.
- Applicant's amendment and arguments with respect to claims filed 10/29/2007 have been considered but are moot in view of the new ground(s) of rejection.
- Amendment to claims and the specification filed 10/29/2007 have been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 41-42, 44-48 and 50-59 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification as filed does not disclose the instant claimed limitation of "fabricating said metallic substrate or said buffer layer system to consist of or to contain on or close to its surface a microstructure of longitudinally oriented, long grains with a high aspect ratio, $a = L_{\text{par}}/L_{\text{per}}$ exceeding 1.5" in claim-41; "a buffer layer system containing or consisting of a microstructure of longitudinally aligned grains with the high aspect ratio, $a = L_{\text{par}}/L_{\text{per}}$ exceeding 1.5," in claim-42, and "or contains a cuprate" in claim-55. The claim 55 that derives its limitation from claim-35, which recited "wherein at least one superconducting compound is a cuprate" and the instant claimed limitation of "or contains a cuprate" is not disclosed in the specification. Claims 44-48, 50-54 and 56-59 inherit the limitations of claim-41 and are rejected under this statute.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 41, 52 and 57 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "close to its surface" in claim 41 is a relative term which renders the claim indefinite. The term "close to its surface" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim 52 recites the limitation "the grains" in Line-1. There is insufficient antecedent basis for this limitation in the claim. Claim 41 recites 'a' for microcrystalline grains of the substrate and 'a' for superconductor grain grains of metallic substrate and grains of superconductor.

Claim 57 recites the limitation "the grains" in Line-1. There is insufficient antecedent basis for this limitation in the claim. Claim 41 contains grains of metallic substrate and grains of superconductor.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 41-42, 44, 46-48, 50-53 and 59 are rejected under 35 U.S.C. 103(a) as obvious over Truchan et al (US 6,455,166) in view of Matsumoto et al (US 6,226,858).

The examiner makes of record that instant claims 41, 50 and 58 recite a broad range of components followed by a series of narrow ranges. For examination purposes, the examiner asserts that the narrow ranges recited in instant claims 41, 50 and 58 are merely exemplary ranges, and thus, the prior art will be applied against the broadest ranges recited in instant claims 41, 50 and 58. Furthermore, the examiner suggests that applicant should delete the narrow ranges from instant claims 41, 50 and 58, and add new dependent claims that recite the narrow ranges recited in instant claims 41, 50 and 58.

Truchan et al et al teach a method of making a super conductor tape containing a biaxially textured polycrystalline face-centered cubic metal article such as Ni and Ni alloy having grain boundaries with misorientation angles greater than about 8 degrees limited to less than about 1%. The metal substrate was first rolled to at least about 95% thickness reduction followed by a first annealing at a temperature less than about 375 C followed by a second rolling operation of not greater than about 6% thickness reduction is provided, followed by a second annealing at a temperature greater than about 400 -1000 C (Abstract; Cl-5, Ln-1; Cl-6, Ln 30; Cl-5, Ln 33-47). The YSZ/CeO₂ buffer layer was deposited by IBAD and YBCO was grown by epitaxy over the substrate (Cl-5, Ln 3-21); and polycrystalline nature of the superconductor would be obvious over the template deposition of the material. Further, In a cube texture, a cube axis, (100), lies parallel to the plane of the sheet and a cube edge, [001], is parallel to the rolling direction, i.e., [100]<001> (Cl-4, Ln 60-65). This in conjunction with the very low degree of misorientation of the grains makes the surface very smooth that is directly related to the $a=L_{par}/L_{per}$ ratio in the instant claims that makes it smooth by virtue of value of 'a' which increases with an increase in the value of L_{par} and a decrease in the value of L_{per} . The prior art teaches a superconductor tape with high degree of biaxial orientation wherein its structure, components used to make the tape and the process steps used to make the tape are similar to that taught by the applicants, and further have the same

common utility as the superconducting tape with high J_c , and the presence of the claimed shape and ratio of the microcrystal grains of the metallic substrate in the prior art tape would be obvious, and this further applies to claim-57. The presence of percolation path along the length of the tape will be obvious because the composition and structure of the tape are similar to that by the applicants.

The prior art is silent about the shape, structure and ratio of the superconductor grains per claims-41 and 53 and microstructure of the buffer layer per claim 42.

In the analogous art Matsumoto et al teach a method of making a superconductor wire by making a polycrystalline metallic substrate having roll textured surface oriented such that [001] plane is parallel with a rolled plane and $\langle 001 \rangle$ axis is parallel with rolled direction, an oxide layer formed on the substrate wherein $>90\%$ of $\langle 100 \rangle$ plane is inclined at most 10 degrees, and forming a superconductor layer over it (Abstract, Cl-3, Ln 43 – Cl-4, Ln 15). Metallic Substrates included Ni and its alloys (Cl-4, Ln 60-67). Superconductors included REBa₂Cu₃O₇ that was coated by method such as vapor phase and liquid phase techniques (Cl-6, Ln 1-8). The buffer layers included one or more layers of CeO₂, YSZ, SrTiO₃ and MgO (Cl-5, Ln 9-65). The Y123 oxide showed orientation of C-axis perpendicular to the surface of tape in its entire length and dependent upon the underlying oxide layer with improved J_c (Cl-8, Ex-1, Ln 43-50; Table-1). The thickness of the tape was 150 micron and the thickness of the YSZ was about 0.2 micron and that of Y123 oxide was 0.4 micron deposited by laser ablation and 3 micron deposited by liquid epitaxy (Cl-8, Ln 3; Cl-9, Ln 30-35, 49-65).

It would have been obvious to a person of ordinary skilled in the art to fabricate the superconductor tape of Truchan et al with the thickness of the various layers in the structure per the teachings of Matsumoto et al with reasonable expectation of success with improved J_c , because Truchan et al is interested in attaining improved performance (Cl-1, Ln 33-37; Cl-6, Ln 23-25, 47-50). The instant claimed structure and properties of the superconductor layer would be obvious in the combined prior art structure because the superconductor is deposited on a metallic substrate with high degree of biaxial orientation, wherein its structure, components used to make the tape and the process steps used to make the tape are similar to that taught by the applicants, and further have the common utility as the superconducting tape with high J_c , and the presence of the claimed ratio of the superconductor grains in the prior art tape

would be obvious over the template formation of buffer and superconductor layers over a structured template of the metallic substrate. The same argument meets the limitation of claims 42

With regard to claims 44, 51 and 59, the prior art teaches IBAD deposition of YSZ and/or CeO₂. Further, it would have been obvious to polish or smoothen the surfaces of the tape layers by mechanical or ion-beams per claims 44, because it was well known to do so in the superconductor art (Furuto et al, US 3,983,521, Cl-8, Ln 50-55; Arendt et al, (US 5,872,080, Cl-6, Ln 10-13; Theme et al, US 6,458,223, Cl-12, Ln 5-9) at the time of disclosure of the invention by the applicants.

With regard to claim 46, the prior art teaches IBAD deposition of REBACUO (Cl-1, Ln 42-50) over a substrate with less than 1% grain boundaries over 8 degrees misorientation and the claimed misorientation of the superconductor grains would be obvious over similar methods and components used in the making of the super conductor tape and the template effect of the substrate grains.

With regard to claims 47-48, it would have been obvious to a person of ordinary skilled in the art to fabricate the YBCO films in the superconductor tape of Truchnan et al either by liquid epitaxy or vapor methods over the teachings of Mastsumoto et al with reasonable expectation of success and predictable results, because Truchnan is suggestive that a variety of deposition processes may be used to deposit various layers of textured substrate material, and the teachings are in the analogous art.

With regard to claim-50, the combined prior art product/tape is similar to that claimed by the applicants, wherein the prior art product is either same or substantially same as that claimed by the applicants, and When the reference teaches a product that appears to be an obvious variant of, the product set forth in a product-by-process claim although produced by a different process, the claim is not patentable. See *In re Marosi*, 710 F.2d 799, 218 USPQ 289 (Fed. Cir. 1983) And *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). See also MPEP §2113.

2. Claims 54-56 are rejected under 35 U.S.C. 103(a) as obvious over Truchan et al (US 6,455,166) in view of Matsumoto et al (US 6,226,858) and Jia et al (US 6,383,989).

The disclosure on the method of making the superconducting tape as set forth in rejection-1 under 35 USC 103(a) over Trucan and Matsumoto is herein incorporated.

The prior art fails to teach a multilayer superconductor structure per the claims.

In the analogous art, Jia et al teach Improvements in critical current capacity for superconducting film structures are disclosed and include the use of, e.g., multilayer YBCO structures where individual YBCO layers are separated by a layer of an insulating material such as CeO₂ and the like, a layer of a conducting material such as strontium ruthenium oxide and the like or by a second superconducting material such as SmBCO and the like (Abstract).

It would have been obvious to a person of ordinary skilled in the art to substitute the YBCO layers in the superconducting tape of Truchan et al and Matsumoto et al with that of Jia et al to benefit from improved J_c with reasonable expectation of success because Truchan is concerned about improving J_c of the superconductor tapes and the teachings are in the analogous art.

3. Claim 58 is rejected under 35 U.S.C. 103(a) as obvious over Truchan et al (US 6,455,166) in view of Matsumoto et al (US 6,226,858) and Tieme et al (US 6,458,223).

With regard to claim-58, Truchan et al is silent about the thickness of the Ni/metallic substrate, while the combined prior art fails to teach the instant claimed size.

In the analogous art Thieme et al teach textured metallic substrates of Cu-Ni alloys for super conductor tapes with a thickness of 51 micron (Abstract, Cl-14, Example-2, Ln 1-2).

It would have been obvious to a person of ordinary skilled in the art to substitute the metallic substrates of Truchan et al and Matsumoto et al with that of Thieme et al as functional equivalent with reasonable expectation of success because the teachings are in the analogous art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on 6.30-4.00 Mon-Thu, 6.30-2.00 Alt Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KMV/
January 04, 2008.


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